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STATURE, HEAD FORM, AND PIGMENTATION OF ADULT MALE IRISH

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(Based upon data collected by C. Wesley Dupertuis)

FOUR FIGURES

121
114 In 1931 the Division of Anthropology of Harvard University began an anthropological survey of Ireland. The project included three fields of investigation: archaeology, social anthropology, and physical anthropology. The field work in archaeology consisted of five summers of excavation which investigated Irish culture from the earliest Stone Age through the first millenium of the Christian era. County Clare was selected as a suitable area for intensive social anthropological work. Studies were carried on there by three investigators for an aggregate of more than 3 years. The study of the physical anthropology of the present adult male population of Ireland was conducted by C. W. Dupertuis over a period of 2 years ('34-'36). It has yielded a series of more than 8800 complete anthropometric and anthroposcopic records, which we believe to represent adequate samples of every part of the Irish population in every area with the exception of the large urban centers. Dr. Helen Dawson of the University of Iowa, working under a National Research Council Fellowship in Anthropology, spent 1 year in collecting data upon the physical anthropology of Irish women and secured some 2000 records. Her material is confined, for the most part, to western Ireland. To Dr. W. W. Howells of the American Museum of Natural History we entrusted the task of studying a large

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121 skeletal series of medieval and modern age, which was tem-
114 porarily disinterred in connection with the excavation of the ruined priory at Gallen, County Offaly.

Many technical papers and monographs upon the archaeo-
114 logical results of the survey have been published in the proceedings and memoirs of the learned societies of Ireland. Some preliminary lectures upon the social anthropology of the rural districts of County Clare have been issued in book form (Arensberg, '37). No general works correlating the results of the different phases of the survey have been published as yet, since these must await the completion of the detailed technical reports. Nothing at all has been brought out on the physical anthropological side, with the exception of a short preview of the data included in Dr. Carleton S. Coon's recent book, "The Races of Europe" ('39, pp. 376–384), although Dr. Howells' monograph on the Gallen skeletons is in the hands of the printer.

The enormous mass of anthropometric data collected by Mr. Dupertuis and by Dr. Dawson has been statistically reduced. At least 2 years more must elapse before it can be published. It is hoped to bring it out in one very large volume under the joint authorship of the present writer and the two anthropologists who gathered the material. The discussion of stature, head form, and pigmentation hereinafter presented must be regarded as a preview. Interpretation of the data cannot be other than tentative until the entire body of anthropological evidence has been thoroughly studied.

ARRANGEMENT OF MATERIAL BY LOCAL SUBGROUPS

In the tables and maps included in this paper the anthro-
128 pological material is divided into nineteen local subgroups. These are single county groups, combinations of adjacent counties, or combinations of part of one county with other counties in whole or in part, or subdivisions of a single county. For 2 years Mr. Dupertuis drove up and down through the whole of Ireland studying the population and the geography of the country. The subgroups were made by him partly upon

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the basis of geography, partly upon his knowledge of the regional anthropological differences. Convenience also dictated the use of county boundaries in the majority of instances.

AGE

The average age of 8809 Irish males is 34.55 ± 0.10 years. In the anthropometric survey of a population it seems desirable to include the males of subadult age (18-20 years) as an offset to those who are presumably senile (60 years and upward). The incomplete growth of the subadults tends to counterbalance the diminished height of the aged. The standard deviation of age for the entire series is 13.95 ± 0.07 years. The county subgroup means of ages range from 29.45 ± 0.29 (Longford, Westmeath) to 38.80 ± 0.51 (Waterford and Wexford).

STATURE

Stature was measured by the standard technique with the Martin anthropometer. Subjects, of course, were required to remove their shoes.

Table 1 presents the data on stature and figure 1 plots the means of stature by local subgroups in intervals of 1 cm. The mean of stature for the whole of Ireland is 172.02 cm., which, of course, is tall. The actual range of subgroup means is only 4 cm.—from 170.52 cm. (Meath, Louth, County Dublin) to 174.54 cm. (Aran Islands). The variabilities of the nineteen subgroups are for the most part neither significantly higher nor lower than that of the total series. The standard deviation of stature for the total series (6.81 ± 0.03 cm.) is not very high when the age range of the population is taken into consideration. It is somewhat higher than that of any of the eight European ethnic series recorded by Davenport and Love as a result of measurements taken upon troops during demobilization after the World War ('21, p. 113). Standard deviations in these series ranged from 6.06 cm. (Italians) to 6.62 cm. (English). The mean height of 6164 Irish was 171.36 cm. and the standard deviation of stature 6.31 cm. Thus our

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sample from all of Ireland is taller and somewhat more variable in stature than the United States army sample. It should be recalled, however, that most of the soldiers were between the ages of 18 and 31 years and that certain stature standards were enforced for the acceptance of recruits. Consequently, the variability of the army sample has probably been reduced

TABLE 1
Stature by county subgroups

	NO.	RANGE	MEAN	S. D.	V.
West Donegal	212	146–193	171.90 ± 0.33	5.17 ± 0.23	4.17 ± 0.14
Mayo	594	143–196	172.17 ± 0.20	7.20 ± 0.14	4.18 ± 0.08
Sligo, Leitrim, South Fermanagh, West Cavan	725	146–202	172.05 ± 0.17	6.72 ± 0.12	3.91 ± 0.07
West Galway (Connemara)	451	155–196	173.13 ± 0.20	6.36 ± 0.14	3.67 ± 0.08
Aran Islands	136	158–193	174.54 ± 0.41	7.14 ± 0.29	4.09 ± 0.17
Clare	944	146–196	172.14 ± 0.14	6.57 ± 0.10	3.82 ± 0.06
Kerry	519	152–199	173.16 ± 0.20	6.90 ± 0.14	3.98 ± 0.08
Cork	565	152–193	172.71 ± 0.19	6.69 ± 0.13	3.87 ± 0.08
Limerick	339	152–193	171.75 ± 0.25	6.75 ± 0.17	3.93 ± 0.10
East Galway, Roscommon	479	149–196	173.28 ± 0.22	7.11 ± 0.15	4.10 ± 0.09
Longford, Westmeath	717	149–187	171.27 ± 0.16	6.30 ± 0.11	3.68 ± 0.07
Offaly, Leix, Kildare	513	152–193	171.57 ± 0.20	6.75 ± 0.14	3.93 ± 0.08
Tipperary, Kilkenny	623	149–196	171.99 ± 0.19	6.87 ± 0.13	3.99 ± 0.08
Waterford, Wexford	425	149–190	171.24 ± 0.23	6.99 ± 0.16	4.08 ± 0.09
Wicklow, Carlow	273	149–202	170.88 ± 0.28	6.96 ± 0.20	4.14 ± 0.12
Meath, Louth, Co. Dublin	427	155–193	170.52 ± 0.21	6.45 ± 0.15	3.78 ± 0.09
East Cavan, Monaghan, Armagh	388	155–190	170.91 ± 0.23	6.63 ± 0.16	3.88 ± 0.09
Antrim, Down	167	149–187	171.39 ± 0.38	7.29 ± 0.27	4.25 ± 0.16
North Fermanagh, East Donegal, Tyrone Londonderry	310	152–190	171.96 ± 0.25	6.57 ± 0.18	3.82 ± 0.10
Total	8807	143–202	172.02 ± 0.05	6.81 ± 0.03	3.96 ± 0.02

by these factors. In a study of native born White criminals of native parentage in the United States the mean of statnre was 171.90 cm. and the standard deviation 6.45 ± 0.05 cm. (Hooton, '39, Table V-14). The age range of the American criminals is more closely comparable with that of the Irish population, but, again, the criminals average somewhat younger (30.70 ± 0.12 years) and have a lower age variability

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(standard deviation 11.40 ± 0.08 years). However, crime is principally a phenomenon of youth and the age variability certainly and the stature variability possibly are affected and reduced thereby.

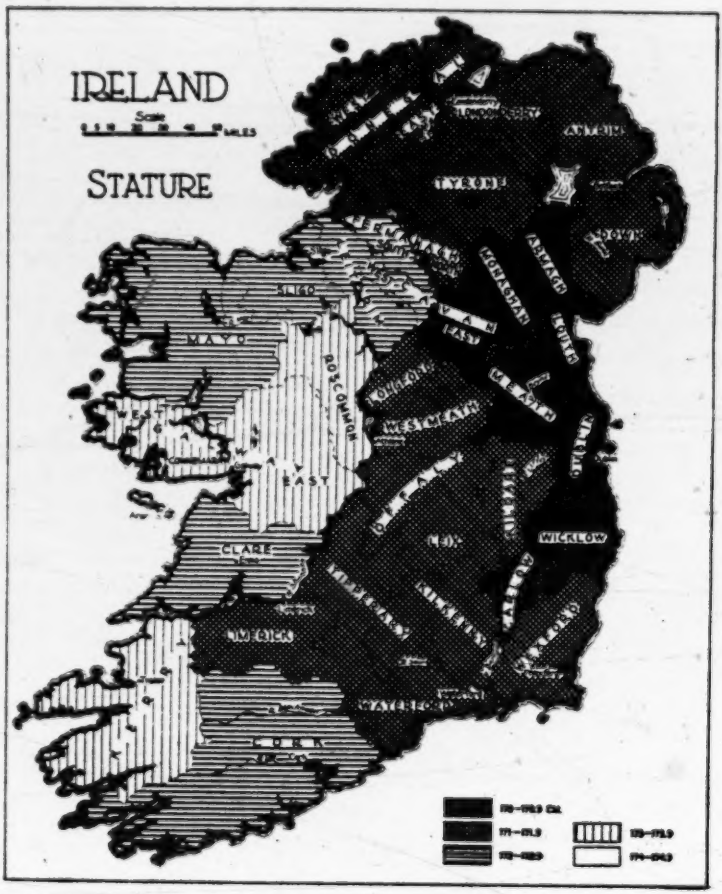

Figure 1

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141 On the whole it seems probable that statural variation in Ireland is high, even when the factors reducing variability in comparable series are taken into consideration. It is useless to speculate upon the causes of the statural superiority of our series over the Irish soldiers in the American army. The latter may have been derived in disproportionate numbers from some of the areas in Ireland where stature tends to be relatively low. The former may have enjoyed the statural increment which appertains in many civilized countries to the younger generation. Who can say?

The regional variation in the means of stature in Ireland is very striking (fig. 1). The shortest statures (170-170.9 cm.) extend in a solid band of county groups along the central portion of the east coast. They include Carlow, Wicklow, Meath, Dublin, Louth, East Cavan, Monaghan, and Armagh. There are two separate blocks of areas with stature means which are submedium for Irish (171-171.9 cm.). The northern block includes Down, Antrim, North Fermanagh, Tyrone, Londonderry, East and West Donegal. The southern block is approximately triangular, with its apex in the center of the island at Longford, the eastern angle of the base at Wexford and the western at Limerick. The western leg of this triangle is roughly the course of the river Shannon. This central triangle of submedium statures is pinched off from the northern block by a westward protrusion of small stature (170-170.9) in East Cavan which meets an Eastern angle of medium stature (172-172.9) made by Leitrim and West Cavan.

There are three separate areas or islands of medium stature, all in the western half of Ireland. A northern island includes South Fermanagh, West Cavan, Leitrim, Sligo and Mayo. The central island is Clare and the southern Cork. Two blocks of tall stature are separated by the medium height area of County Clare. The northern tall block consists of Roscommon, East Galway and West Galway; the southern is Kerry. Finally in the Bay of Galway and off the west coast of Clare stature attains its maximum in Ireland in the isolated Aran Islands.

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A first glance reveals no striking correlations of these stature areas with temperature, rainfall, vegetation or general topography. A consideration of the significance of these distributions may be deferred until the other data of this paper have been presented.

CEPHALIC INDEX

The length-breadth index of the head yields a mesocephalic mean in every Irish subgroup. The mean of the entire Irish series is 78.87 ± 0.02 and the regional range is from 77.79 (Meath, Louth, County Dublin) to 80.04 (Kerry). Thus the spread of subgroup averages is only 2.25 index units. The standard deviation of the total series (3.33 ± 0.02) is low, as are also those of all of the subgroups (table 2).

TABLE 2

Cephalic index by county subgroups

	NO.	RANGE	MEAN	S. D.	V.
West Donegal	212	71–91	79.20 ± 0.14	3.12 ± 0.10	3.94 ± 0.13
Mayo	594	71–91	79.44 ± 0.09	3.42 ± 0.07	4.31 ± 0.08
Silgo, Leitrim, South Fermanagh, West Cavan	722	68–91	78.75 ± 0.08	3.21 ± 0.06	4.08 ± 0.07
West Galway (Connemara)	451	68–91	78.48 ± 0.10	3.12 ± 0.07	3.98 ± 0.09
Aran Islands	134	68–88	77.85 ± 0.09	3.18 ± 0.13	4.08 ± 0.17
Clare	944	65–91	79.65 ± 0.07	3.39 ± 0.05	4.36 ± 0.07
Kerry	518	68–91	80.04 ± 0.10	3.30 ± 0.07	4.12 ± 0.09
Cork	565	68–94	79.62 ± 0.10	3.42 ± 0.07	4.30 ± 0.09
Limerick	338	71–91	79.38 ± 0.12	3.21 ± 0.08	4.04 ± 0.10
East Galway, Roscommon	477	68–91	78.60 ± 0.10	3.21 ± 0.07	4.08 ± 0.09
Longford, Westmeath	717	65–94	78.00 ± 0.08	3.30 ± 0.06	4.23 ± 0.08
Offaly, Leix, Kildare	513	59–91	78.21 ± 0.10	3.42 ± 0.07	4.37 ± 0.09
Tipperary, Kilkenny	623	68–91	79.02 ± 0.09	3.30 ± 0.06	4.18 ± 0.08
Waterford, Wexford	425	71–91	78.75 ± 0.11	3.27 ± 0.08	4.15 ± 0.10
Wicklow, Carlow	273	68–88	78.30 ± 0.12	3.03 ± 0.09	3.87 ± 0.11
Meath, Louth, Co. Dublin	427	71–88	77.79 ± 0.10	2.94 ± 0.07	3.78 ± 0.09
East Cavan, Monaghan, Armagh	388	68–88	78.06 ± 0.11	3.12 ± 0.08	4.00 ± 0.10
Antrim, Down	167	65–91	78.93 ± 0.18	3.42 ± 0.13	4.33 ± 0.16
North Fermanagh, East Donegal, Tyrone, Londonderry	310	65–91	78.66 ± 0.12	3.21 ± 0.09	4.08 ± 0.11
Total	8798	59–94	78.87 ± 0.02	3.33 ± 0.02	4.22 ± 0.02

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141 [102] Nevertheless, the plotting of county group averages at intervals of one-half index units reveals some interesting regional variations (fig. 2). Mean indices below 78 are recorded in two geographical areas. The first of these is a block along the middle of the east coast. This block includes Dublin,

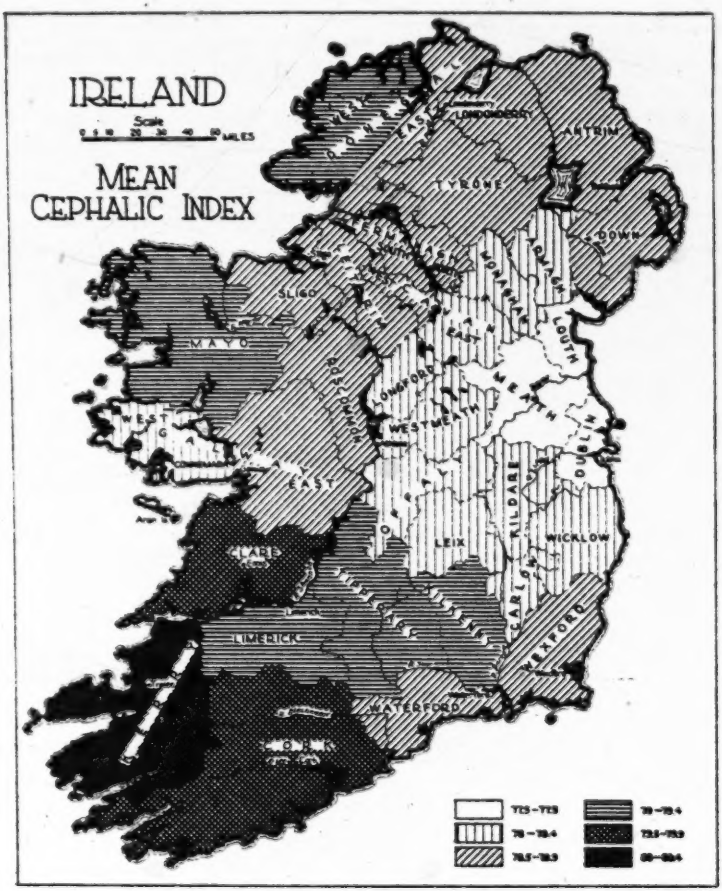

Figure 2

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Louth, and Meath. The other area of lowest cephalic index is the Aran Islands off the west coast. Bordering the relatively long-headed eastern area are subgroups with slightly higher mean cephalic indices (78-78.4). On the northern fringe we have Armagh, Monaghan, and East Cavan; on the southern, Carlow, Wicklow, Kildare, Leix, and Offaly; on the west, Longford and Westmeath. West Galway (Connemara) occupies a similar marginal position of slightly less accentuated long-headedness north of the comparatively dolichocephalic Aran Islands. 141

A group of counties with mean head forms approaching the value for all of Ireland (78.5-78.9) includes a large northern and central block and a southeastern island which consists of Wexford and Waterford. The great north central block has its broad base in the northeastern counties—Down, Antrim, East Donegal and Londonderry, and extends southwest in a wide band including Tyrone, North and South Fermanagh, West Cavan, Leitrim, Sligo, Roscommon, and East Galway.

There are two islands of somewhat broader-headed mesocephals in the northwest—West Donegal and Mayo—with cephalic indices from 79 to 79.4. Correspondingly, in the south central section the three counties of Kilkenny, Tipperary, and Limerick, also belong to this category. Then in the southwest we have Clare on the north and Cork on the south with still higher mesocephaly (79.5-79.9), each bordering upon Kerry, the most broad-headed area in the island.

HAIR COLOR

Hair color in Ireland is predominantly brown. Nine out of ten men have some shade of brown hair (dark brown, brown, red-brown, golden brown, or ash brown). The modal shade, however, is dark brown, both in the total series and in thirteen of nineteen county subgroups. Black hair is found in only 2.73% of the total series, although it rises to 8.02% in West Donegal and sinks below 1% in the Aran Islands, East Galway, Roscommon, Longford and Westmeath. Medium brown or flat brown which constitutes 35.37% of the total series is 142

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142 commonest in the Aran Islands (50%) and in Longford and Westmeath (44.49%). Red-brown hair is also at its maximum in the Aran Islands. Golden brown, which is a shade usually classified as blond, is found in 9.11% of the total series. It is least common in West Donegal (4.72%) and attains from 10% to 13% in several subgroups. Ash brown, golden, and ash are very rare throughout the entire island. Red hair is not perhaps as common as might be expected (4.28% in the total series). It rises to 8.03% in Sligo, Leitrim, South Fermanagh and West Cavan, but drops to 1.65% in Waterford and Wexford.

Brown and red-brown, which are the medium shades of hair color, aggregate 40.77%. The really dark hair (black and dark brown) amount to 42.39%. Light shades total 14.98%, if red is included as "light," which, in my opinion, is its correct classification. All of the details are set forth in table 3.

TABLE 3

Hair color, head, by county subgroups

	BLACK		DARK BROWN		BROWN		RED-BROWN	
	No.	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*
West Donegal	17	8.02	87	41.04	73	34.43	10	4.72
Mayo	20	3.37	267	44.95	193	32.49	35	5.89
Sligo, Leitrim, South Fermanagh, West Cavan	11	1.52	239	33.10	256	35.46	53	7.34
West Galway (Connemara)	6	1.33	161	35.70	161	35.70	36	7.98
Aran Islands	1	0.76	29	21.97	66	50.00	15	11.36
Clare	39	4.14	371	39.34	322	34.15	71	7.53
Kerry	24	4.62	220	42.39	173	33.33	20	3.85
Cork	14	2.48	217	38.41	197	34.87	26	4.60
Limerick	8	2.37	140	41.42	114	33.73	22	6.51
East Galway, Roscommon	4	0.84	173	36.12	183	38.20	37	7.72
Longford, Westmeath	2	0.28	194	27.40	315	44.49	39	5.51
Offaly, Leix, Kildare	10	1.95	224	43.75	172	33.59	33	6.45
Tipperary, Kilkenny	15	2.41	273	43.82	192	30.82	30	4.82
Waterford, Wexford	15	3.53	200	47.06	112	26.35	14	3.29
Wicklow, Carlow	15	5.49	112	41.03	98	35.90	9	3.30
Meath, Louth, Co. Dublin	16	3.75	196	45.90	151	35.36	6	1.41
East Cavan, Monaghan, Armagh	15	3.87	178	45.88	145	37.37	9	2.32
Antrim, Down	2	1.20	79	47.31	60	35.93	4	2.40
North Fermanagh, East Donegal, Tyrone, Londonderry	6	1.94	125	40.32	125	40.32	6	1.94
Total	240	2.73	3485	39.66	3108	35.37	475	5.40

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	GOLDEN BROWN		ASH-BROWN		GOLDEN		ASH	
	No.	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*
West Donegal	10	4.72	0	0	1	0.47	0	0
Mayo	30	5.05	1	0.17	6	1.01	2	0.34
Sligo, Leitrim, South Fermanagh, West Cavan	70	9.70	4	0.55	4	0.55	0	0
West Galway (Connemara)	54	11.97	1	0.22	4	0.89	0	0
Aran Islands	10	7.58	0	0	0	0	0	0
Clare	64	6.79	3	0.32	8	0.85	0	0
Kerry	41	7.90	3	0.58	11	2.12	0	0
Cork	72	12.74	0	0	10	1.77	1	0.18
Limerick	28	8.28	2	0.59	5	1.48	0	0
East Galway, Roscommon	45	9.39	1	0.21	4	0.84	0	0
Longford, Westmeath	92	12.99	8	1.13	10	1.41	5	0.71
Offaly, Leix, Kildare	41	8.01	3	0.59	4	0.78	0	0
Tipperary, Kilkenny	65	10.43	2	0.32	6	0.96	1	0.16
Waterford Wexford	54	12.71	4	0.94	3	0.71	2	0.47
Wicklow, Carlow	20	7.33	3	1.10	0	0	1	0.37
Meath, Louth, Co. Dublin	35	8.20	0	0	1	0.23	0	0
East Cavan, Monaghan, Armagh	23	5.93	3	0.77	3	0.77	0	0
Antrim, Down	17	10.18	0	0	1	0.60	0	0
North Fermanagh, East Donegal, Tyrone, Londonderry	30	9.68	3	0.97	4	1.29	1	0.32
Total	801	9.11	41	0.47	85	0.97	13	0.15

	RED		WHITE		TOTAL
	No.	*Per cent*	*No.*	*Per cent*	*No.*
West Donegal	12	5.66	2	0.94	212
Mayo	31	5.22	9	1.52	594
Sligo, Leitrim, South Fermanagh, West Cavan	58	8.03	27	3.74	722
West Galway (Connemara)	20	4.43	8	1.77	451
Aran Islands	9	6.82	2	1.52	132
Clare	48	5.09	17	1.80	943
Kerry	16	3.08	11	2.12	519
Cork	15	2.65	13	2.30	565
Limerick	12	3.55	7	2.07	338
East Galway, Roscommon	25	5.22	7	1.46	479
Longford, Westmeath	34	4.80	9	1.27	708
Offaly, Leix, Kildare	19	3.71	6	1.17	512
Tipperary, Kilkenny	25	4.01	14	2.25	623
Waterford Wexford	7	1.65	14	3.29	425
Wicklow, Carlow	9	3.30	6	2.20	273
Meath, Louth, Co. Dublin	16	3.75	6	1.41	427
East Cavan, Monaghan, Armagh	9	2.32	3	0.77	388
Antrim, Down	4	2.40	0	0	167
North Fermanagh, East Donegal, Tyrone, Londonderry	7	2.26	3	0.97	310
Total	376	4.28	164	1.87	8788

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142 Figure 3 shows the distribution of dark hair (black plus dark brown). The areas in filled cross-hatch on the map have 50% or more of dark hair. These include only Waterford and Wexford, the two southeastern coastal counties. The cross-hatched areas (45-49.9% of dark hair) include a solid strip

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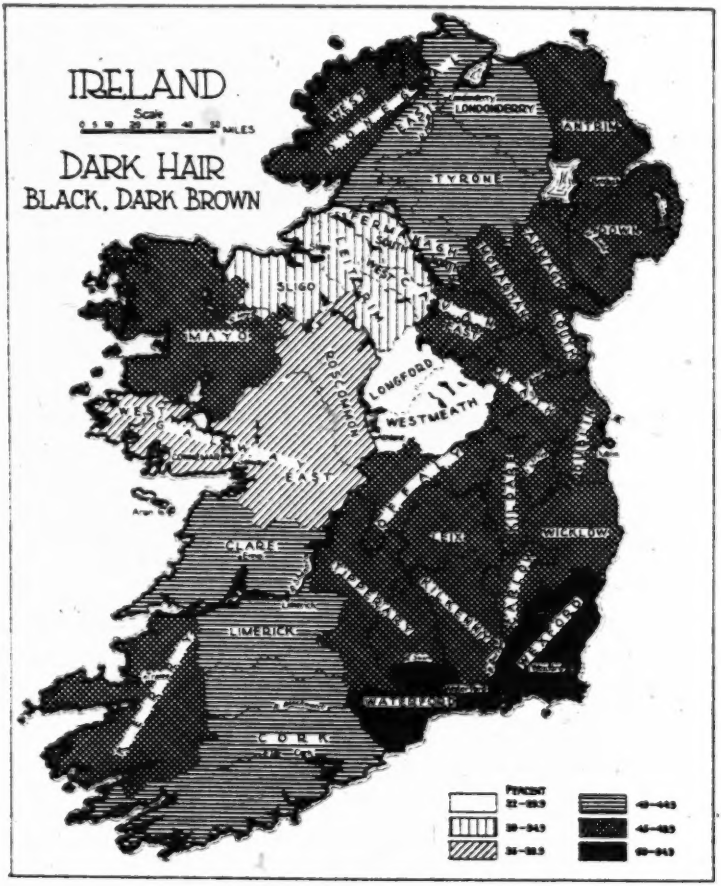

Figure 3

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along the east coast from Antrim in the north through Wicklow in the south and extending westward into central Ireland in Armagh, East Cavan, Meath, Offaly, Leix, Kildare, Carlow, Kilkenny, and Tipperary. Three isolated areas of this same rather dark-haired dominance occur in the west peninsulas of West Donegal, Mayo, and Kerry. From Londonderry and East Donegal there extends in a southwesterly direction a zone of counties in which dark hair is less frequent. Both the northeast third of this band (Londonderry, East Donegal, Tyrone and North Fermanagh) and the southwest third (Clare, Limerick, and Cork) show percentages of dark hair between 40 and 45. The middle portion of this zone is much lighter in hair color. Almost in the center of the island Longford and Westmeath present proportions of dark hair less than 30, while a similar condition is to be observed in the Aran Islands off the west coast. From the light-haired concentration of Longford and Westmeath there extends northwestward another relatively light-haired band including Leitrim, West Cavan, South Fermanagh, and Sligo. To the south and west another extension of this light-haired area, not quite so intense, consists of Roscommon and the whole of Galway. Thus County Mayo is cut off from the dark-haired area along the east coast by a broad semicircular band of relative blondness.

If we make a new plotting in which the residue of dark hair minus light is mapped (black plus dark brown) minus (golden brown plus ash-brown plus ash plus golden plus red), the picture of hair pigmentation in Ireland is not greatly altered. Longford, Westmeath and the Aran Islands still show the lightest hair color, but a dark-haired band extends from Antrim down the east coast to Wicklow which corresponds to the Western outposts of West Donegal and Mayo. On the other hand, the southwestern county, Kerry, shows a smaller residuum of dark hair than these areas named; as do also Waterford and Wexford, which in dark hair alone take first place. Then, too, Cork shows an unexpected diminution of dark hair, due to its high percentage of golden brown. However, in general, the distribution remains the same—a broad band of light

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142 hair running through the center of the island, separating two darker areas and reaching the west seaboard in the two regions surrounding Sligo Bay and Galway Bay.

EYE COLOR

Perhaps the most striking feature of Irish anthropology is the persistent association of light eyes with dark hair. Table 4 gives the distribution of eye color. Less than ½% of all Irish males have pure brown eyes—either light or dark. But nearly 42% have pure blue eyes. The dominant mixed shade is blue-brown which occurs in 44.34% of the total series, ranging from 31.94% in North Fermanagh, East Donegal, Tyrone, and Londonderry, to 55.68% in Kerry. Gray-brown and green-brown are not very common and gray is nearly as rare as pure brown.

The highest percentage of pure blue eyes is found in Wicklow and Carlow with 50.18%. This is extremely curious in view of the fact that these counties are very low in light hair. If we consider the distribution of pure light eyes (fig. 4) some strange contradictions become apparent. The areas of lowest percentage of light eyes (35-39.9%) are Kerry and Cork. Kerry actually has the lowest percentage and this is consistent with the fact that it has the largest residuum of dark hair. West Donegal and Mayo, together with Limerick and Clare, also fall naturally into groups with comparatively small proportions of light eyes. But the Aran Islands, which are among the lightest in hair color are strangely low in light eyes, whereas all the eastern county strip of dark-haired peoples is high in light eyes—higher indeed than most of the central zone in which light hair predominates.

If we consider the distribution of mixed eyes, the result is about the same. In the west areas high in mixed eyes are also high in dark hair, with the exception of the Aran Islands. The central zone of comparatively blond counties has less pure blue eyes than the eastern and southeastern darker haired zone. Waterford and Wexford, which have the highest absolute percentage of dark hair, are among the lowest counties in proportions of mixed eyes.

TABLE 4

Eye color by county subgroups

	DARK AND LIGHT BROWN		GRAY-BROWN		GREEN-BROWN		BLUE-BROWN	
	No.	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*
West Donegal	0	0	10	4.72	7	3.30	107	50.47
Mayo	1	0.17	25	4.21	17	2.86	300	50.50
Sligo, Leitrim, South Fermanagh, West Cavan	7	0.97	15	2.07	25	3.45	327	45.10
West Galway (Connemara)	1	0.22	20	4.43	15	3.33	200	44.35
Aran Islands	0	0	1	0.74	0	0	75	55.15
Clare	0	0	58	6.14	17	1.80	443	46.93
Kerry	1	0.19	24	4.62	17	3.28	289	55.68
Cork	2	0.36	33	5.84	8	1.42	312	55.22
Limerick	1	0.29	17	5.01	6	1.77	165	48.67
East Galway, Roscommon	1	0.21	15	3.13	16	3.34	215	44.89
Longford, Westmeath	9	1.25	34	4.73	32	4.45	301	41.86
Offaly, Leix, Kildare	6	1.17	25	4.87	24	4.68	206	40.16
Tipperary, Kilkenny	2	0.32	37	5.94	26	4.17	265	42.54
Waterford, Wexford	2	0.47	31	7.29	28	6.59	142	33.41
Wicklow, Carlow	1	0.37	12	4.40	11	4.03	94	34.43
Meath, Louth, Co. Dublin	3	1.17	25	5.85	18	4.22	165	38.64
East Cavan, Monaghan, Armagh	1	0.26	12	3.09	11	2.84	146	37.63
Antrim, Down	1	0.60	13	7.78	13	7.78	58	34.73
North Fermanagh, East Donegal, Tyrone, Londonderry	1	0.32	18	5.81	12	3.87	99	31.94
Total	42	0.48	425	4.82	303	3.44	3909	44.37

	GRAY		GRAY-BLUE		BLUE		UNMATCHED		TOTAL
	No.	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*No.*
West Donegal	2	0.94	4	1.89	81	38.21	1	0.47	212
Mayo	2	0.34	15	2.53	232	39.06	2	0.34	594
Sligo, Leitrim, South Fermanagh, West Cavan	1	0.14	19	2.62	330	45.52	1	0.14	725
West Galway (Connemara)	2	0.44	14	3.10	198	43.90	1	0.22	451
Aran Islands	0	0	3	2.21	57	41.91	0	0	136
Clare	0	0	36	3.81	388	41.19	3	0.32	944
Kerry	1	0.19	7	1.35	175	33.72	4	0.77	519
Cork	2	0.35	15	2.65	189	33.45	4	0.71	565
Limerick	2	0.59	9	2.65	138	40.71	1	0.29	339
East Galway, Roscommon	1	0.21	10	2.09	219	45.72	2	0.42	479
Longford, Westmeath	3	0.42	51	7.09	289	40.19	0	0	719
Offaly, Leix, Kildare	4	0.78	30	5.85	216	42.11	2	0.39	513
Tipperary, Kilkenny	0	0	39	6.28	250	40.13	4	0.64	623
Waterford, Wexford	0	0	26	6.12	194	45.65	2	0.47	425
Wicklow, Carlow	1	0.37	16	5.86	137	50.18	1	0.37	273
Meath, Louth, Co. Dublin	4	0.94	23	5.39	187	43.79	0	0	427
East Cavan, Monaghan, Armagh	2	0.52	17	4.38	193	49.74	6	1.55	388
Antrim, Down	2	1.20	6	3.59	71	42.51	3	1.80	167
North Fermanagh, East Donegal, Tyrone, Londonderry	4	1.29	20	6.45	154	49.68	2	0.65	310
Total	33	0.37	360	4.08	3698	41.98	39	0.44	8809

4:Hooton D-4,5 (1934-1936) 1940
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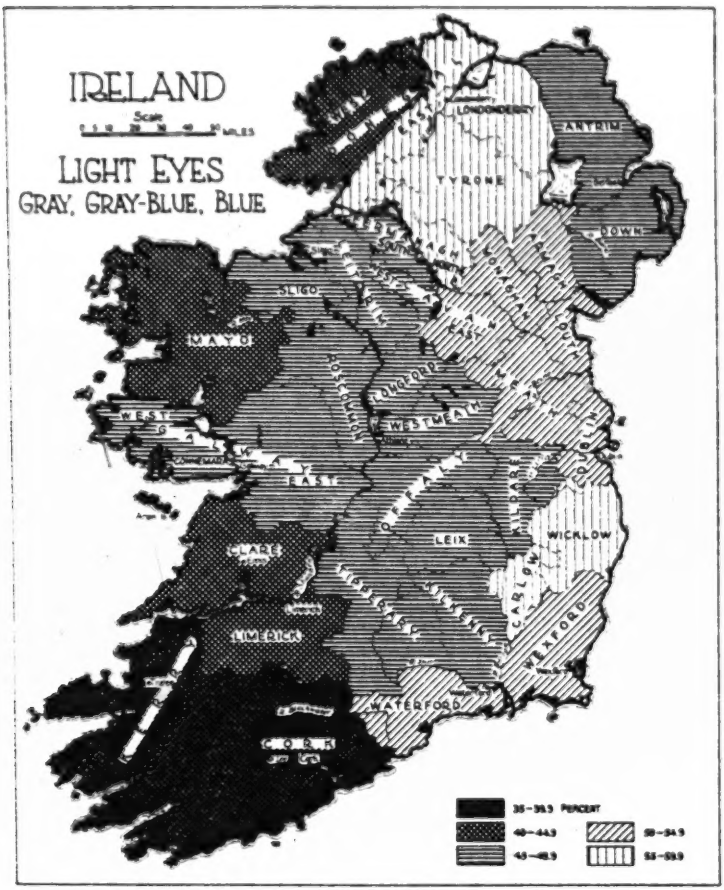

Figure 4

CORRELATION OF MAP DISTRIBUTIONS

Now, if we put together the distribution of stature, head form, hair color and eye color, some interesting correspondences are evident. Ireland presents three masses of high land projecting westward into the Atlantic. These are West Done-

4:Hooton D-4,5 (1934-1936) 1940
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gal, Mayo and West Galway, Kerry and (in part) Cork. The Aran Islands represent a fourth western area. West Donegal seems to be characterized by excesses of dark hair and mixed eyes and a very slightly higher mesocephaly than the total Irish series. Mayo is slightly high in stature and in cephalic index, definitely so in proportions of dark hair and mixed eyes. West Galway, on the other hand, is notable for markedly tall stature, lowering of the cephalic index, and lighter hair and eyes. This tendency is still further accentuated in the Aran Islands which are tallest of all of the Irish subgroups, are almost dolichocephalic, and have nearly the highest proportion of light hair shades. Yet eye color in the Aran Islands is predominantly mixed. 142

Kerry is also tall, but the most round-headed of the Irish subgroups and excessive in dark hair, and lowest in light eyes.

The central plain of Ireland and especially the counties of Westmeath and Longford show the strongest concentration of blondness which is accompanied by slightly shortened stature, diminished lightness of eye, and mesocephaly. This blond area is sharply delimited to the east by a coastal band of darker haired and even shorter dolichocephals, notably concentrated in Meath, Louth, and County Dublin, which is the shortest and most dolichocephalic area of Ireland, but ranks high both in darkness of hair and in lightness of eyes.

Now it is quite reckless to attempt definitive racial correlations on the basis of the coincidences and differences in geographical distribution of separately plotted anthropological characters. Actually, racial type distributions can be accurately ascertained only by correlations of morphological and metric features in individuals. From the data presented in this paper, however, a few purely preliminary and tentative suggestions may be made, subject to revision or retraction in the light of an exhaustive study of all of the material and a consideration of historical and prehistorical events.

It may be presumed that the western parts of the island represent to some extent refuge areas occupied by the earlier strata of the population. It is in precisely these areas (West 142 174 [197]

4:Hooton D-4,5 (1934-1936) 1940
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142 174 [197] Donegal, Mayo, West Galway, the Aran Islands and Kerry) that our information gives us the highest predominance of Gaelic speech. If the anthropological characters plotted separately actually combine in the populations of these areas we should say that the earliest population stratum of the island consists of tall, subbrachycephals with dark hair and mixed eyes and a second element, even taller, subdolichocephalic with light hair and mixed eyes. Then since the latter type presents the highest proportion of Gaelic speakers we should be inclined to hazard a guess that the tall brunet brachycephals represent the earlier pre-Keltic population and that Gaelic languages were introduced by the tall, long-headed near-blonds.

The blond, long-headed element in the central plain, concentrated in Longford and Westmeath is presumably Nordic and possibly represents a survival in great part from Iron Age Nordic, Viking, and other Scandinavian occupations. The Aran Islanders and the inhabitants of Galway may perhaps owe their comparative blondness and long-headedness to the mixture with these invaders which has gone on throughout the plain, but it is also possible, as previously stated, that the original Goidelic invaders may have been near-Nordics.

Along the east coast the short dark dolichocephals with long heads but very light eyes may also be, for the most part, the survivals of pre-Keltic populations. Some element in the population must have been responsible for the introduction of the Megalithic monuments and I believe it to have been these brunets with blue eyes. The association of light eyes with dark hair was formerly considered by me to be the result of the crossing of a pure brunet Mediterranean stock with a pure blond Nordic stock in which the eye color of one race combined with the hair color of another. However, recent anthropometric studies in Iran and Iraq, especially those of Dr. Henry Field, reveal the presence of many otherwise purely brunet, long-headed stocks of basic Mediterranean affinities which have almost no pure brown eyes, but generally irides of mixed pigmentation—brown in the pupillary zone and blue in the

4:Hooton D-4,5 (1934-1936) 1940
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peripheral zones. Of course, there can be no doubt that the inhabitants of Ireland have undergone extensive mixture with blue-eyed Nordics. However, it seems certain that some Mediterranean stocks have developed what Dr. Carleton Coon calls "incipient eye blondness" without any necessary intermixture with the generally depigmented Nordic race. 142 174

One consideration in regard to the county subgroups must be given some space here. The highest percentage of dark hair occurs in Waterford and Wexford and the highest percentage of light hair in Longford and Westmeath. Now blondness in mixed stocks diminishes with age and it happens that the Waterford and Wexford subgroup is the oldest of the nineteen included in the series (38.80 years), whereas the Longford, Westmeath group is the youngest (29.45 years). The latter is, in fact, 3 years below the mean age of any other subgroup. Thus it is possible that the blondness of this subgroup may have been exaggerated by this age factor, but it hardly seems probable that the excess of dark hair in Wexford and Waterford is wholly due to superior age since the increments of age bring excessive graying of hair (at a maximum) in this group. This senile change detracts from the proportion of dark hair. 142

One of the most striking facts of the anthropometric distributions here plotted is the dolichocephalic blond crescent which swings from the northwest at Sligo Bay through the Central Plain and back westward terminating in West Galway and the Aran Islands. It suggests rather strongly a Nordic penetration by way of these west coast ports. It is tempting to connect it with the Viking period. Ingress to the rich lands of the Central Plain would have been possible by this route, although it must not be forgotten that West Galway—a barren area—has this same blondness and long-headedness associated with tall stature. It is also notable that this blond crescent is not as light-eyed as the areas further east, and, in its central portion, is not characterized by particularly high stature. Further, its dolichocephaly is not so marked as that of the counties to the east of the upper course of the Shannon. 142 174

4:Hooton D-4.5 (1934-1936) 1940
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142 On the basis then of these raw distribution maps on which
174 are plotted uncorrelated anthropometric means and pigmentation percentages we may discern the following three more or less clearly demarcated anthropological and geographical areas.

1. The Western Peninsulas: West Donegal, Mayo and Kerry (including parts of Clare and Cork). This region finds the association of tall stature, sub-brachycephaly, dark hair and mixed eyes. It is strongly Gaelic in speech and possibly includes the largest numbers of the Mesolithic stock which first settled Ireland from Scotland.

2. The Central East Coast: The shortest and most dolichocephalic region with highest concentration of light eyes (especially blue eyes), but very dark hair. Perhaps this may be the area settled by the Megalithic people who sailed up the Irish Channel.

3. The Blond Crescent (with its horns at Sligo and Galway Bays and its convexity at Longford and Westmeath). In its belly it is the blondest area in Ireland, in the southwest horn (West Galway and the Aran Islands) it is the tallest and almost the longest-headed area in Ireland. All of this area is notably characterized by grayish and light mixed eyes rather than pure blue eyes. It seems to be peopled by a majority of Predominantly Nordic and Nordic peoples. It may contain the bulk of the descendants of any or all of the three following putative groups of early populations: Bronze Age peoples coming from Scotland (Goidels?); Iron Age Nordic invaders (if there were such); Viking and other Scandinavian historic colonists, possibly entering by way of Galway and Sligo Bays.

It should be reiterated here that superimposed distribution maps of isolated characters may not represent in any accurate sense the combinations of features in individuals which constitute racial types. Subsequent study of the distribution of racial types by individuals may alter considerably our prediction of the arrangement of racial areas in Ireland.

4:Hooton D-4,5 (1934-1936) 1940
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ADDENDUM

From this Irish county series, as here discussed, all persons of Protestant religion have been omitted. The number thus excluded is 312 Presbyterians and 488 Church of Ireland, of these the vast majority come from the northern counties— Antrim, Armagh, Fermanagh, Down, Londonderry, Tyrone, Cavan, Donegal, Monaghan. Mr. Dupertuis directed this sorting because he was of the opinion that the Ulster Protestants really represent, in large part, a recent Scotch immigration, and the Church of Ireland English immigrations. In the final report on Ireland these northern Protestants will be included. They could hardly alter the distribution pictures perceptibly, except (possibly) in the counties mentioned.

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